



Carnegie Mellon  
Software Engineering Institute



# Capability Maturity Model<sup>®</sup> Integration (CMMI<sup>SM</sup>): Current Status and Standardization Aspects

**David H. Kitson**  
**Manager, SEI Appraiser Program**

**Software Engineering Institute**  
**Carnegie Mellon University**  
**Pittsburgh, PA 15213-3890**

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# Agenda

**CMMI Project**

**Source Models and Methods**

**Goals and Benefits**

**Schedule**

**Transition Plan**

**Status and Relation to Key International Standards**



# The CMMI Project

**Sponsored by the DOD and the National Defense Industrial Association (NDIA)**

**Collaborative endeavor**

- **Industry**
- **Government**
- **Software Engineering Institute (SEI)**

**Over 100 people involved**



# The CMMI Development Team

**U.S. Army, Navy, Air Force  
Federal Aviation Administration  
National Security Agency  
Software Engineering Institute  
ADP, Inc.  
AT&T Labs  
BAE  
Boeing  
Computer Sciences Corporation  
EER Systems  
Ericsson Canada  
Ernst and Young  
General Dynamics  
Harris Corporation**

**Honeywell  
KPMG  
Litton  
Lockheed Martin  
Motorola  
Northrop Grumman  
Pacific Bell  
Q-Labs  
Raytheon  
Rockwell Collins  
Sverdrup Corporation  
Thomson CSF  
TRW**



# CMMI Design Goals

**Integrate the source models, eliminate inconsistencies,  
reduce duplication**

**Reduce the cost of implementing model-based process  
improvement**

**Increase clarity and understanding**

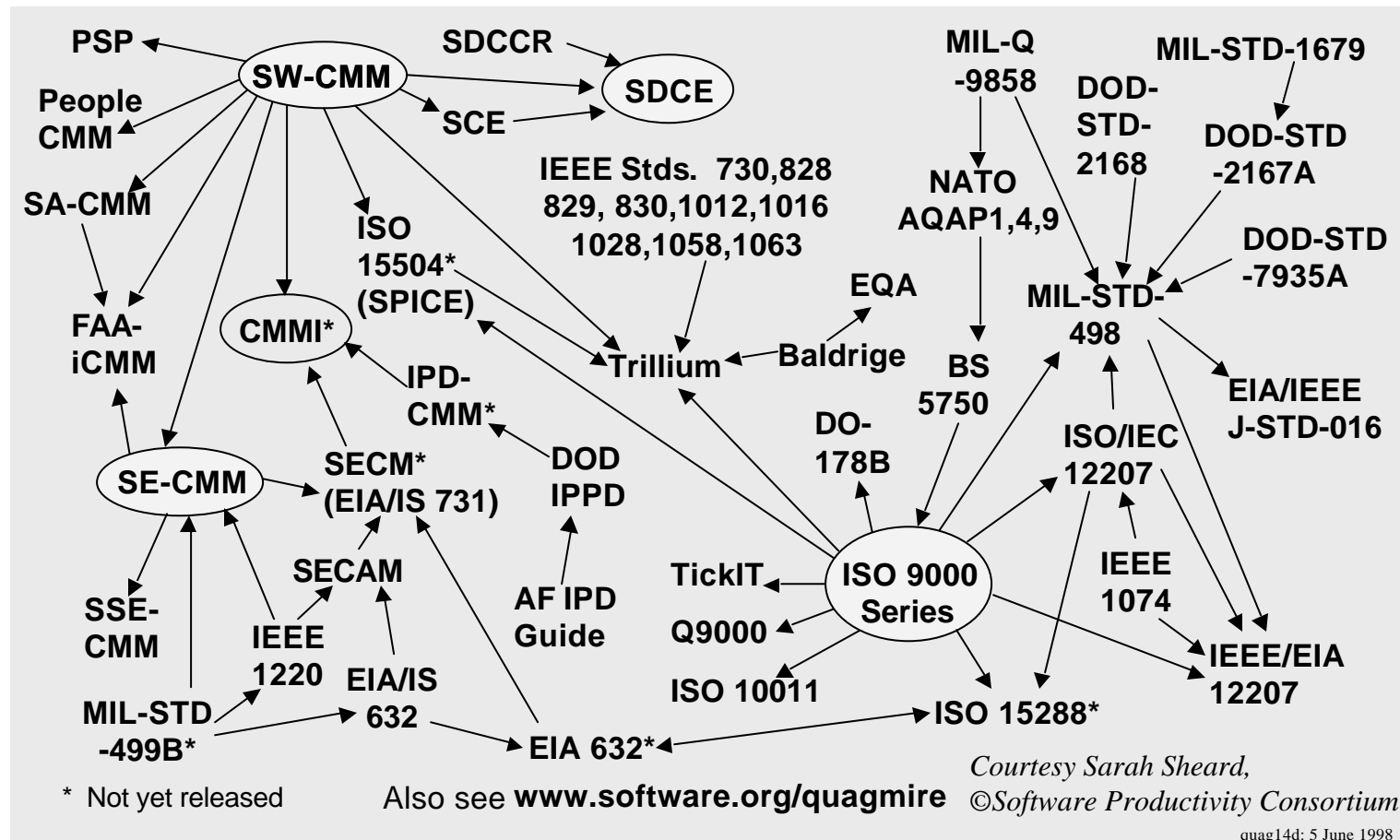
- **Common terminology**
- **Consistent style**
- **Uniform construction rules**
- **Common components**

**Assure consistency with ISO 15504**

**Be sensitive to impact on legacy efforts**



# The Frameworks Quagmire





# CMMI Benefits

**Efficient, effective assessment and improvement across multiple process disciplines in an organization**

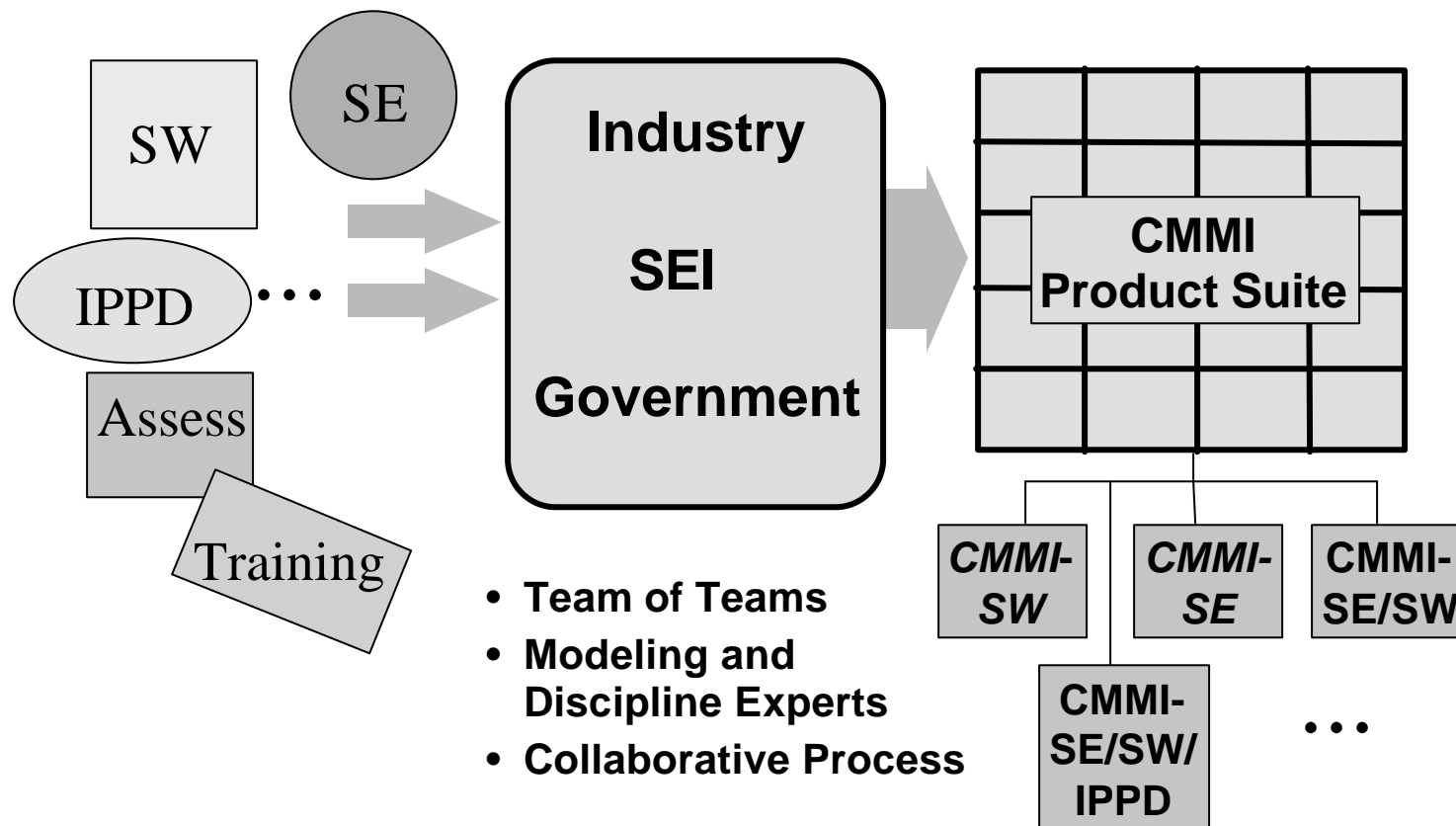
**Reduced training and assessment costs**

**A common, integrated vision of improvement for all elements of an organization**

**A means of representing new discipline-specific information in a standard, proven process improvement context**



# The CMMI Solution: A Product Line Approach







# CMMI Source Models

**Capability Maturity Model for Software V2,  
draft C (SW-CMM V2C)**

**EIA Interim Standard 731, System Engineering  
Capability Model (SECM)**

**Integrated Product Development Capability Maturity  
Model, draft V0.98 (IPD-CMM)**



# Model Metrics

<u>Release</u>	<u>PAs/ FAs</u>	<u>Goals/ Themes*</u>	<u>Activities/ Practices**</u>	
SW-CMM V1.1		18	52	316
SW-CMM V2C		19	62	318
EIA/IS 731		19	77	383
		} 38	} 139	} 701
IPD-CMM V0.98		23	60	865
CMMI V0.1 SE/SW		27	149	550
CMMI V0.2 SE/SW		24	80	528
CMMI V1.0 SE/SW		22	70	417

\* Ratable components

\*\* Key to implementation effort



# CMMI “Source” Assessment Methods

**CMM-Based Appraisal for Internal Process  
Improvement (CBA IPI)**

**EIA Interim Standard 731.2, Systems Engineering  
Capability Model Appraisal Method**



# CMMI Product Suite

<b>Aug 2000</b>	<b>Status</b>	<b>Released CMMI-SE/SW V1.0 for initial use</b>
		<b>Released CMMI-SE/SW/A to stakeholders for review</b>
		<b>Released Assessment Requirements for CMMI V1.0 for initial use</b>
<b>Oct 2000</b>		<b>Released Standard CMMI Assessment Method for Process Improvement V1.0 for initial use</b>
		<b>Intro to CMMI model (staged) training baselined</b>
	<b>baselined</b>	<b>Intro to CMMI model (continuous) training</b>
		<b>Intermediate CMMI Model training beta</b>
		<b>(Release CMMI-SE/SW/IPPD V1.0 for initial use)</b>



# CMMI Product Suite Plans

<b>Nov 2000</b>	<b>Release CMMI-SE/SW/A for initial piloting</b>
<b>Fall 2001</b>	<b>Release CMMI-SE/SW V1. 1</b>
	<b>Release Assessment Requirements for CMMI V1.1</b>
	<b>Release Standard CMMI Assessment Method for Process Improvement V1.1</b>
<b>Fall 2003</b>	<b>Complete sunset period for precursor models</b>



# Evolving Policy

**The CMMI Steering Group has established the schedule for the sunset period of the legacy models (i.e., SW-CMM V1.1, EIA IS 731) to be three years after release of the CMMI-SE/SW/IPPD Version 1.0 Product Suite.**

**A subsequent release, Version 1.1, is planned one year later to provide additional refinement and update based on the continuing CMMI pilot program.**



# CMMI Transition Plan

## Development Phase

- Development of CMMI products
- Verification and validation of CMMI products

## Transition Phase

- Approval of initial CMMI products for public release
- Evidence of sufficient use
- Transition planning to help organizations use CMMI products

## Sustainment Phase

- Upkeep and continuous improvement of the product suite
- Additional evidence of adoption and use



# CMMI and Standards

**CMMI has emerged from a blending of “standards”**

- **An interim national standard model and method (731)**
- **A de facto standard model and method (CMM and CBA IPI)**

**A-spec requirements relevant to international standards:**

- **2.3 Reference Documents**

- 2.3.1 Applicable ISO/IEC documents, including ISO/IEC 12207 and ISO/IEC 15504.

- **3.1 Development User Requirements**

- 3.1.6 The CMMI Product Suite shall be consistent and compatible with ISO/IEC 15504.”





# Conformancy with 15504

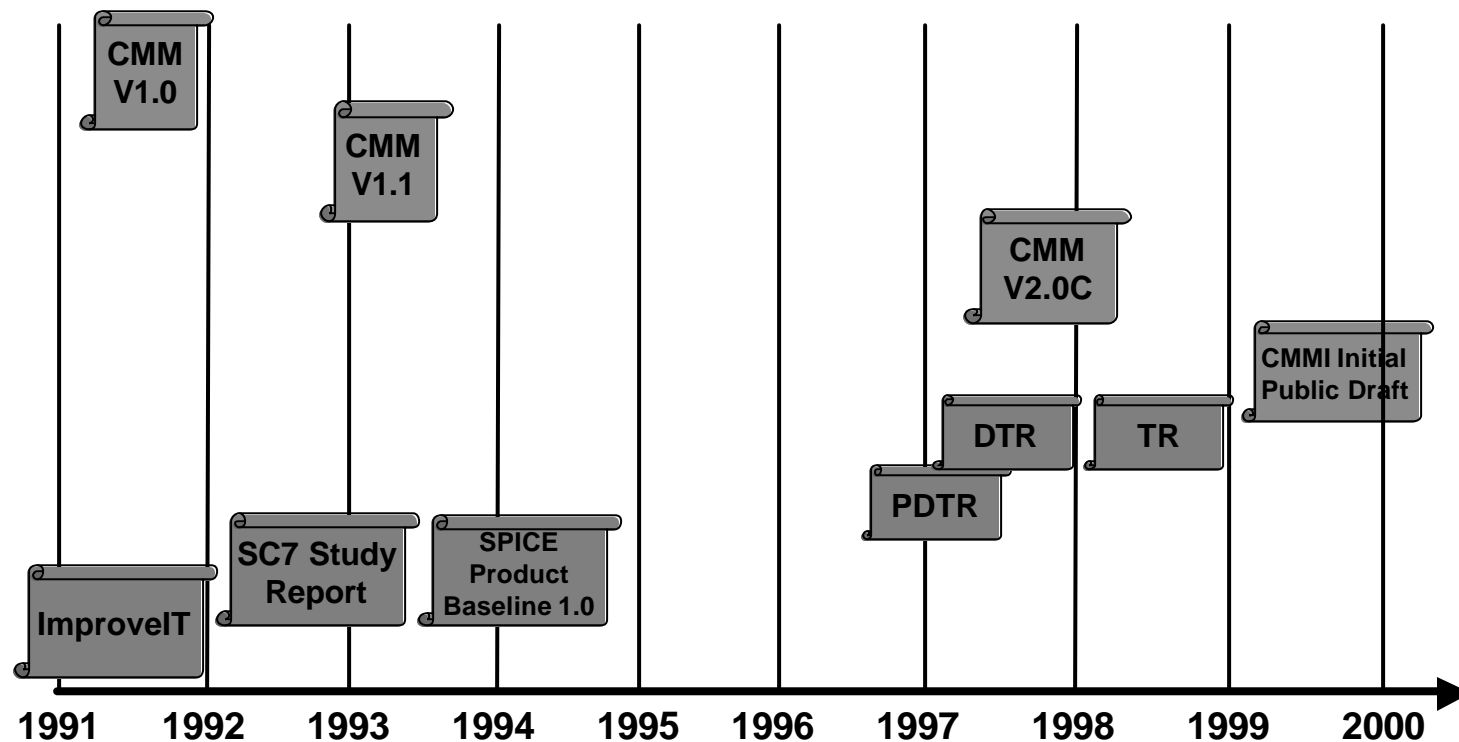
**To the extent that CMMI achieves full conformance with 15504 it will achieve a significant status relative to**

- **ISO/IEC 12207:1995 (Software Life Cycle Processes)**
- **ISO/IEC CD 15288 (System Life Cycle Processes)**

**Conformance requires that a CMMI discipline model satisfy 15504 model compatibility requirements and that the assessment process satisfy 15504 assessment requirements.**



# Progression of CMM and 15504





# 15504 Timeline

**1998: All 15504 (TR baseline) documents published and available for purchase**

**1999: SC7 approval for proposal to progress 15504 towards international standardization**

- requirements for IS
- high-level design
- work in progress for designs for component documents

**(2002-3) Publication as full IS planned**



# Process Definition Issue

**It is intended that the scope of 15504 will be all SC7 processes (which extends to software-based systems):**

- **it is therefore not possible for 15504-2 to be a complete set of process definitions**
- **..so, what do we do with the current set of process definitions?**

**Leading candidate at this stage is to detach the current process reference model from 15504-2 and treat it as an externally specified entity:**

- **would have to satisfy certain constraints (compliance requirements**
- **constitutes an evolution of the thinking espoused by the US in Pilanesburg, South Africa in 1996**



# Evolution of 15504 Specificity

**1st generation (pre-Pilanesburg) - practices were HARD-WIRED into 15504 (as a normative component - BPG)**

**2nd generation (pre-IS) - process definitions were HARD-WIRED into 15504 (as a normative component - 15504-2)**

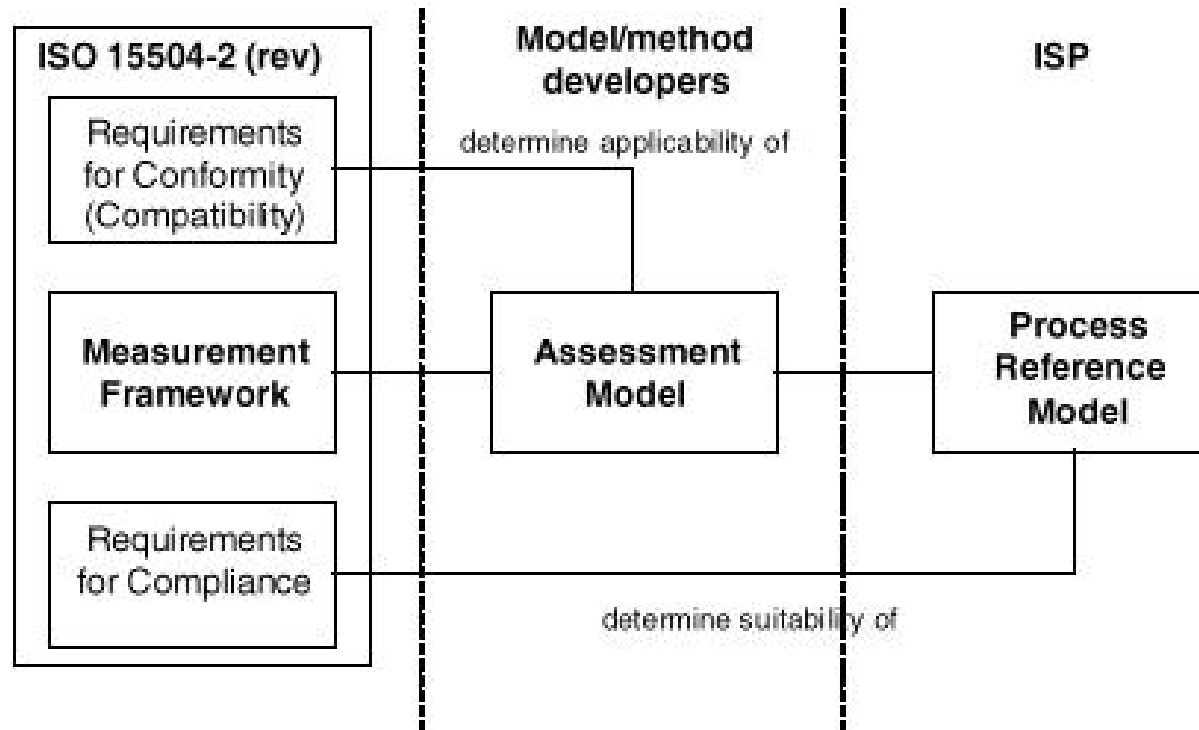
**3rd generation (IS) - compliance requirements for Process Reference Models (PRMs) HARD-WIRED into 15504 (as a normative component - 15504-2):**

- **PRMs will be externally specified (current proposed mechanism is International Standardized Profiles - ISPs)**
- **12207 will include as an amendment a PRM encompassing TR 15504-2 process definitions**



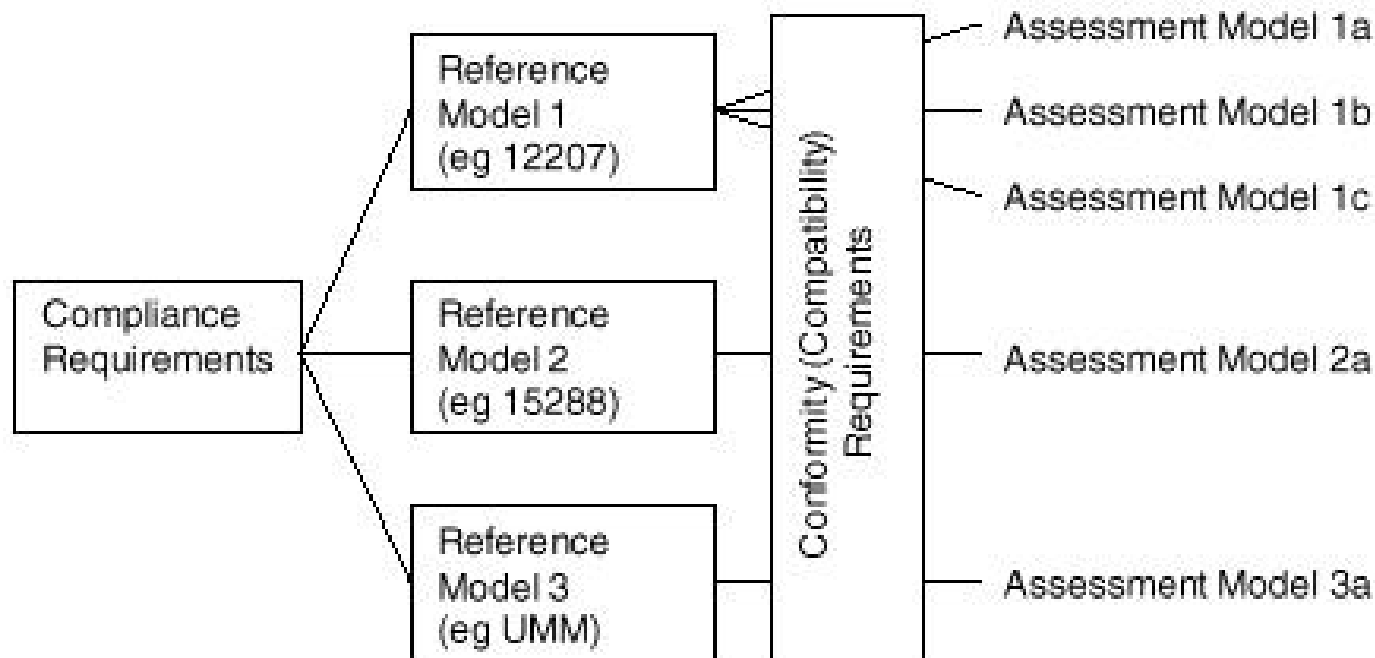
# Candidate Architecture for

15504



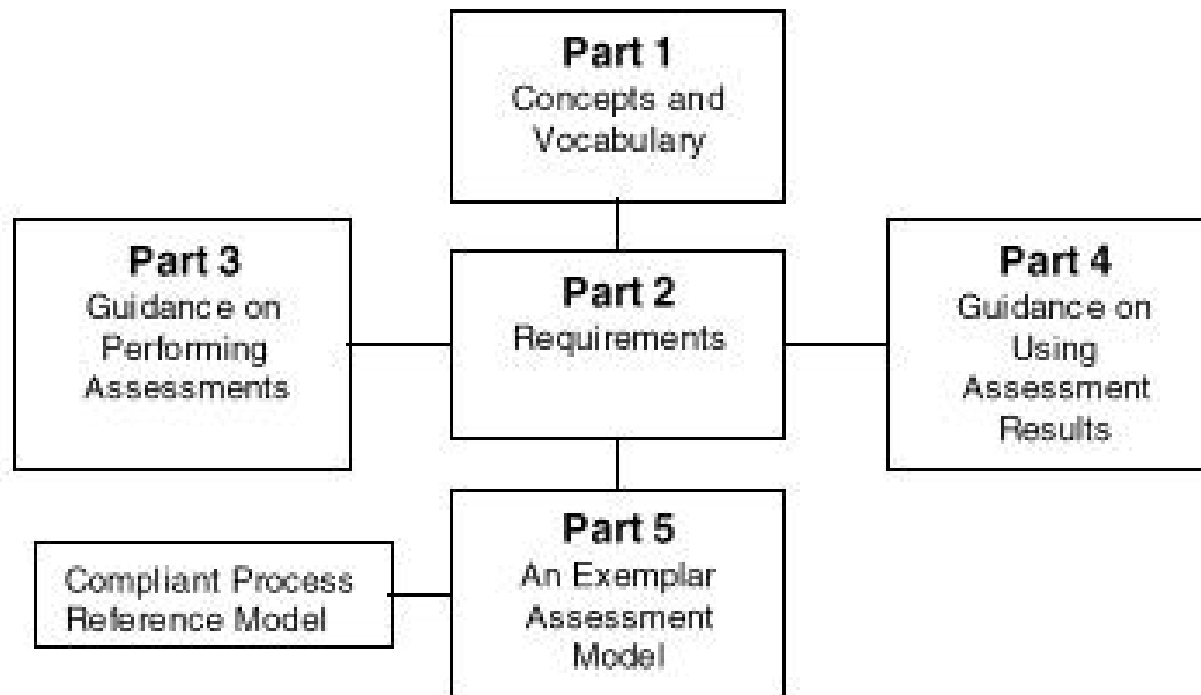


# Models in the Revised





# Structure of the Revised Document Set







# Implications for CMMI -1

**CMMI product suite can choose which Process Reference Model(s) (PRMs) it wishes to claim 15504 conformity (that is, satisfies the 15504 model compatibility requirements) with.**

**It is also a possibility that one or more NEW PRMs could be created which are specifically designed around CMMI models.**

**It appears likely at this stage that the old 15504-5 will evolve to claim 15504 conformance to the PRM defined in the amendment to 12207, which is expected to be very much like the old 15504-2 process dimension.**



# Implications for CMMI -2

**For the near term, it is prudent to complete the effort to satisfy the 15504 model compatibility requirements relative to the TR baseline.**

**It will take 2-3 years for the 12207 amendment to progress to completion. However, once a CMMI baseline is established which is 15504 conformant, attention should be shifted to the 12207 and 15288 PRMs or an alternate.**



# Implications for CMMI -3

**The US needs to consider whether to focus on the 12207 and 15288 PRMs for the long term or to create one or more new PRMs**

**CMMI stakeholders need to track the progress of work in 15504, 12207 and 15288 to ensure that their needs are being considered and adequately addressed.**



# For More Information About CMMI

## Go to CMMI Website

<http://www.sei.cmu.edu/cmmi>

<http://www.sei.cmu.edu/cmmi/products/public-release.html>

## Contact SEI Customer Relations

Customer Relations  
Software Engineering Institute  
Carnegie Mellon University  
Pittsburgh, PA 15213-3890  
FAX: (412) 268-5800  
[customer-relations@sei.cmu.edu](mailto:customer-relations@sei.cmu.edu)



# For More Information About 15504

**Go to SEI website:**

- <http://www.sei.cmu.edu/activities/iso-15504/>